



## ORIGINAL ARTICLE

## Levels of Empathy Orientation after the Implementation of a New Curriculum

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### Abstract

**Objective:** To compare the level of empathy orientation of the students in the Dentistry Program from the Universidad Metropolitana according to gender and levels of education after the implementation of a new curriculum. **Material and Methods:** An exploratory and transversal research was made. The studied population are the students from the first and the fifth academic year in the Dentistry Undergraduate Program from the Universidad Metropolitana (Barranquilla, Colombia) (n = 371, N = 482; 76.97% of the population) First: 92; Second: 83; Third: 60; Fourth: 71 and Fifth: 65, being females = 235 and males = 136. Data collection was done in March 2016 for the present study and in 2012. The Jefferson Scale of Physician Empathy was applied to participants. **Results:** For the "Academic Years" factor, the means in the first undergraduate years are similar with an increase in the last two undergraduate years; females have superior values than males. However, the behavior of these means is different when analyzing the combined levels of both factors. The female gender increases steadily in the first four years and decreases in the fifth year; The male gender goes down from first to second place and increases steadily until the fifth year surpassing the female in this last year. **Conclusion:** The general results obtained on empathy have improved compared to those results from 2012. The questions that obtained significant scores were those related to the cognitive component. This could be explained by the incorporation of a greater number of community activities into vulnerable population.

**Keywords:** Dentistry; Empathy; Education, Graduate.

## Introduction

In the light of the new researches in the field of health care and communication in health-care, it is impossible to ignore the role that empathy plays in the establishment and development of the professional relationship between patient-health care; as well as the role that the institutions that undertake the education of students in health carry out in the development of this skills.

In the field of health, the importance of communication between doctor and patient is being acknowledged, which is a challenge for schools which main training efforts have traditionally focused on the technical aspects of medicine, leaving Humanistic aspects to the side [1].

In the process of training a physician, the communication with the patient acquires a relevant value since it becomes the way by which the medical professional practice is qualified as well as the medical humanistic practice [2].

Published studies relate empathy with better clinical competence [3], it easier patient verbalization, it provides greater participation of the patient in their healing process, it betters their life quality and reduces stress [4]. For the health professional, empathy also has its benefits because it is correlated with better professional satisfaction, less stress, and less burnout syndrome among health workers [4].

In Latin America, a number of studies have been carried out on the levels of empathy in different medicine, dentistry and nursing programs, and the results regarding the course and gender differences are contradictory. While the results of some studies on empathy levels show that as students are going through the last semester of their undergraduate year they show overall a sustained increase [5,6], in others there are no differences [7,8] and in other studies it is shown that the level of empathy decreases [9,10]. In other studies it was also found that accordingly to the gender, higher empathy levels are observed in women [5,9-11] or, on the contrary, higher empathy levels in men [12], or as it has been reported in some studies, no difference between genders [6-8]. All these evidences show that there is variability in the response of the levels of empathy within and among the different universities. As a consequence, these results found in the estimation of the levels of empathy in the different academic years or courses show that the decline of the level of empathy is not a general fact, as it has been suggested in the literature [9,13] no the gender differences seem to be inclined only in favor of women.

The objective of this research is to measure the level of empathy orientation of the students of the Dentistry Program of the Universidad Metropolitana according to gender and levels of education after the implementation of a new curriculum and compare it with the results obtained in the program 4 years ago [6].

## Material and Methods

### Data Collection

This study is part of a multicenter project where the empathy, gender, course, aggressiveness, family functionality and personality styles are attempted to be correlated.

The studied population consisted of students from the first to fifth academic year enrolled in the Dentistry Program of the Universidad Metropolitana (Barranquilla, Colombia) ( $n = 371$  of an  $N = 482$ ). From this population the following stratifications were found per year: First: 92; Second: 83; Third: 60; Fourth: 71 and Fifth: 65. In the gender factor, the sample composition was as follows: females = 235 and males = 136.

Data was collected in March 2016 for the present study and in 2012 for previous [6]. The Jefferson Scale of Physician Empathy (JSPE) in its Spanish version for medical students (version S), validated in Mexico and Chile [12,15] and adapted for students of dentistry in Colombia was applied [6]. The study was anonymous and confidential (neutral operator). Before using the JSPE it was submitted to a judge's panel (three relevant physicians of the medical profession in order to verify the cultural and content validity [6,12,13]. The students' comprehension of the culturally adapted scale was performed through a pilot test.

### Statistic Analysis

The data was subjected to a Normality Tests (Kolmogorov-Smirnov) and a Quality of Variance (Levene). The internal reliability of the data was estimated using the general Cronbach's alpha and the values of this statistician as they were being eliminated each of the elements (questions), intraclass correlation coefficient, Hotelling's T<sup>2</sup> and Tukey's non-additivity test, Mean and standard deviation were estimated.

A b factorial analysis of variance (ANOVA), model III, was applied in order to find differences between the means between the academic years, between the genders and in the interaction of these two factors. The data was described using simple arithmetic and box graphs, they were processed using the statistical program SPSS 20.0. The comparison between the empathy data observed in this same undergraduate program, obtained in a previous work (2012) [6], with those observed in the present study was performed using a discriminant test, using the statistic  $\lambda$  (Lambda de Wilks) to determine differences in each question of the instrument and the M test of Box to compare the variance-covariance matrices between the groups. The significance level used was  $\alpha \leq 0.05$  and  $\beta < 0.20$  in all cases.

### Ethical Aspects

This work is exploratory with a transversal approach, carried out with a bioethical point of view, under the Helsinki norms and with the approval of the Research Bioethics Committee of the Universidad Metropolitana (Act N.001/2015).

### Results

The Kolmogorov-Smirnov and Levene tests were not significant ( $p > 0.05$ ) in empathy levels data in the present study; therefore, the data is distributed in a normal way and with equal variances. Cronbach's alpha values were satisfactory (unclassified = 0.769 and classified = 0.782), from which it

is inferred that the data have internal reliability. The total Cronbach's alpha value, if an element were removed (a question), fluctuated between values  $[0.745; 0.777]$  and it is inferred that the test maintains a high reliability, independently of the fact that one of them is eliminated in the estimation of this statistician. The intraclass correlation coefficient was 0.78 ( $F = 8.92$ ,  $p < 0.005$ ), which demonstrates the reliability of the data. The T2 test of Hotelling ( $F = 69.81$ ) ( $p < 0.005$ ) and Tukey non-additive ( $F = 0.96$ ) were not significant ( $p > 0.05$ ). In the first case, it is inferred that the means of the questions are different from each other, which shows that not all questions contribute equally to the overall mean of the questions (mean = 5.27) and, in the second case. It is inferred that the characteristics of the data do not need to be increased to achieve its additive character.

The results of the estimation of means, standard deviation and sample size for each level of the two factors studied are shown in Table 1 and in Figures 1 and 2, respectively. Figure 3 also shows the results of the combined means of the levels of both factors.

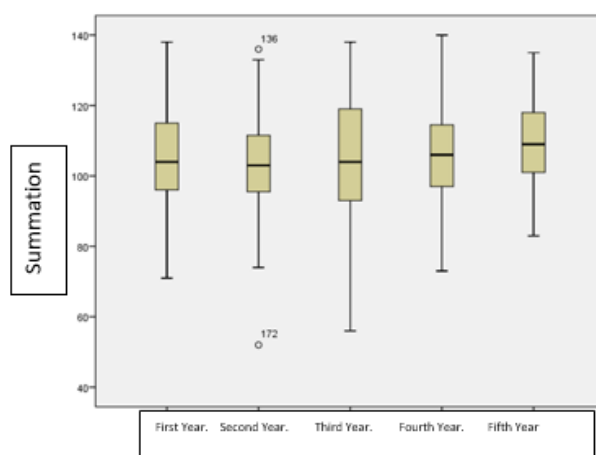
**Table 1. Results of the estimation of means and standard deviations in each level of the factors studied and in the combination of the levels of both factors.**

Academic Year	Gender	Means	Standard Deviation	n
First Year	Female	104,53	12,497	58
	Male	104,74	14,902	34
	Total	104,61	13,356	92
Second Year	Female	107,14	13,214	58
	Male	95,32	15,537	25
	Total	103,58	14,892	83
Third Year	Female	107,71	19,548	42
	Male	96,78	12,331	18
	Total	104,43	18,300	60
Fourth Year	Female	108,89	13,316	45
	Male	100,46	13,677	26
	Total	105,80	13,964	71
Fifth Year	Female	106,78	12,765	32
	Male	111,39	10,805	33
	Total	109,12	11,946	65
Total	Female	106,89	14,309	235
	Male	102,75	14,626	136
	Total	105,37	14,544	371

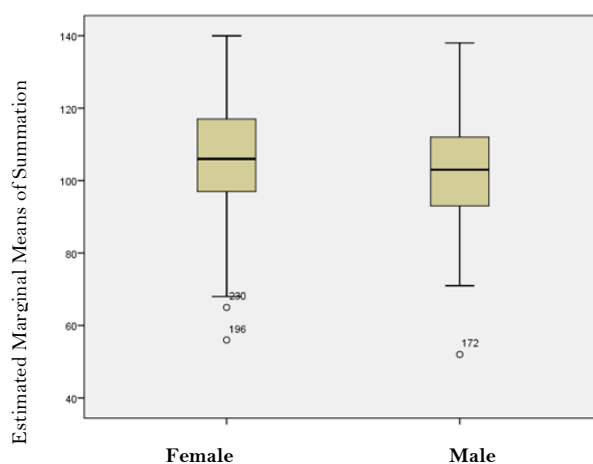
The ANOVA results were significant ( $p = 0.019$ ) for the "Academic Years" factor, gender and interaction were highly significant ( $p = 0.001$ ,  $p = 0.002$  respectively) (Figure 1). The eta square values were found to be 0.032, 0.031 and 0.047 for both factors and their interaction and potency was 0.796; 0.922 and 0.937 respectively for both cases. From these results it can be inferred that the size of the effect of the statistical differences that were found are adequate and, therefore, the differences found are not small.

In addition, it is not required to increase the sample size to reach the value of the accepted power (0.80). The value of  $R^2$  corrected was 0.064, which means that the factors studied explain only 6.4% of all variation in empathy. In the "Academic Years" factor it was observed that the means in the first years are similar and an increase occurs in the last two years; whereas in the gender it was

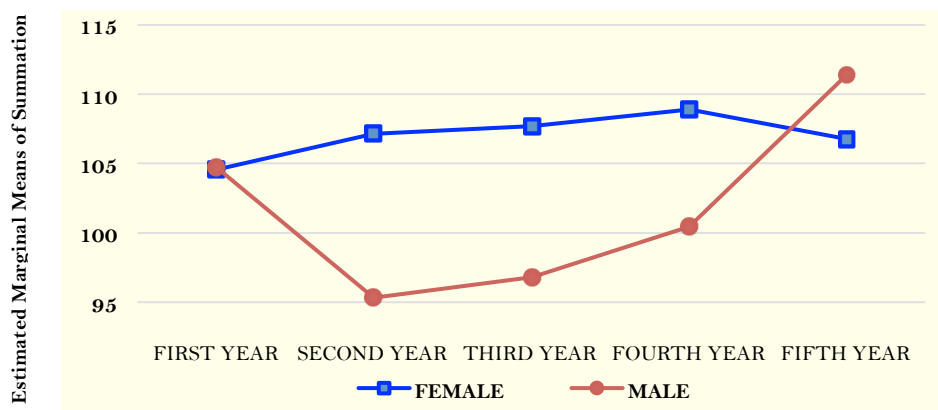
found that the female gender has values superior to the male gender. However, the behavior of these means is different when analyzing the combined levels of both factors. The female gender increases steadily in the first four years and decreases in the fifth year; while the male descends from first to second and increases steadily until the fifth year surpassing the female in this last year.



**Figure 1.** Results of means and standard deviations in the levels of the academic years factor in boxes charts (including atypical data).



**Figure 2.** Results of means and standard deviations in the levels of the gender factor in box charts (including atypical data).



**Figure 3.** Results of the combined means of the levels of both factors.

The overall mean values of the means and standard deviations (DS) were in the year of implementation 2012 of 99.41 with DS = 15.14; In the year 2016 were of 105.37 with SD = 15.14. Table 2 shows the results of the comparison of both years of application in each of the questions. And the statistician  $\lambda$  (F) found significant and highly significant differences ( $p < 0.05$ ;  $p < 0.005$ ) in the questions 2,3,4,5,7,10,11,12,13,14, 16 and 18. The M statistic of Box ( $M = 23.76$ ) was highly significant ( $p < 0.001$ ).

**Table 2. Results of the comparison of the means of the empathy levels of each question (P) between the groups compared (years of application).**

	Lambda of Wilks	F	Sig.
P1	0,997	1,419	0,234
P2	0,992	4,297	0,039
P3	0,991	4,888	0,027
P4	0,979	11,269	0,001
P5	0,992	4,224	0,040
P6	0,997	1,372	0,242
P7	0,985	7,745	0,006
P8	0,995	2,661	0,103
P9	1,000	0,008	0,928
P10	0,988	6,565	0,011
P11	0,985	7,740	0,006
P12	0,987	6,967	0,009
P13	0,990	5,316	0,022
P14	0,991	4,945	0,027
P15	0,995	2,691	0,102
P16	0,977	12,090	0,001
P17	1,000	0,146	0,703
P18	0,994	3,146	0,077
P19	1,000	0,000	0,987
P20	0,997	1,386	0,240

## Discussion

The results obtained in this research showed that in the Academic Years factor average increases for the last two years of the undergraduate studies. This increasing behavior in the levels of empathy is in concordance with the ones observed in other studies done to odontology students in Latin America [5,10,12,15-18], Europe [19] and Asia [20]. Likewise, studies to measure the level of empathy in medical students in Asia [21] and nursing in Latin America [22,23] have shown an increase in levels as the undergraduate course increases. However, there are some studies where results were obtained in which the empathy levels of dental students decreased as the undergraduate course increased [7,24,25] and others in which there were no significant differences in the undergraduate course factor in odontology students [5,11,15,23,26,27], Medicine [28-30], Kinesiology [31], Nursing [23,30] and Occupational Therapy [32].

In the Gender factor it was found that the female gender has values superior to the male gender. In this study the female gender increases steadily in the first four years and decreases in the fifth year, contrary to the results obtained in a study in Argentina where women tend to be more

homogenous throughout the courses with a "sharp" increase in the last course [33]. The results obtained coincide with similar investigations carried out to dentistry students in Latin America where women had higher empathy scores in relation to men [5,7,10-12,15,17,18,26], Medicine [24,30,34,35], nursing and occupational therapists [36]. For this case, the research results that give as a result empathy levels higher in men than in women are less [20,21,33,37]. With regard to gender, the results of 2016 were similar to those obtained in 2012.

In the study carried out in 2012 [6] the levels of empathy in the fifth year were increased, however, in the present investigation the increase was observed in the fourth and the fifth year. Several authors explain the increase of the levels in the higher courses by the increase of the clinical practice of the students at the end of the undergraduate studies and the responsibility and commitment they have with their patients [17], this is also attributed to the students' exposure to the professional field which place them in contact with the patients' pain and the responsibilities given to care for them [20].

To try to explain the increase of empathy obtained, it is necessary to consider that the Dentistry Program of the Universidad Metropolitana is in a process of transition between two curricula. At the time the sample was taken (first semester of 2016) the new curriculum had been implemented up to the fourth year. It is important to highlight the differences between the two curricula in order to try to explain the results obtained in the light of the achieved restructuration, since the new plan incorporates a greater number of community activities into the vulnerable population within the fourth year activities, represented in the components of Intra-hospital Rotatory learning and Extramural Rotations, that previously were circumscribed to the fifth year. Similarly, it happens with the Preventive Community learning component that in the previous Curriculum had four modules and in the new Curriculum has added one more module, involving a greater amount of activities with real patients and their health needs, by incorporating these into the clinical practice performed that starts in the second year.

It is clear from the results that the implementation of the new curriculum could have been associated with an increase in the general levels of empathy and could be explained by the incorporation of more patient care activities associated with an active teaching processes. If the answers are analyzed independently, with regard to the means of the empathy levels of each question of the EEMJ, it should be emphasized that most of the questions that were significant in both periods (2012 and 2016) are related to the cognitive dimension, that is, the taking of perspective, the ability to abstract the mental processes of other people [38], since empathy is a factor of interpersonal ability. Questions relating to the cognitive dimension of empathy that scored significantly involved understanding the patient's feelings and assessing non-verbal communication as important elements in the dentist-patient relationship. Even though in the new curriculum activities were increased in some clinical components, the mere fact of student involvement in patient care appears to have not tipped the scale toward a better score in the affective component of empathy, which Explains how the reaction to the emotional state of another person [38], being that the questions that obtained a



significant score in said component, were related to dismiss the role of the patient's emotions in obtaining results in health

As an alternative to promote the development of the affective component, the French experience that was developed in four dental Programs, in which a Patient Centered Care course was given with a focus based on arts, dentistry narrative activities and communication workshops for fourth year students without changing the curriculum. The results suggested that the ACP training constitutes a promising approach for the development of the empathy capacity of dentistry students [39]. Other attempt to develop empathy is the Western Ontario University study, which introduced as methodology the usage of videos where patients described their dental experiences. When comparing the pre and post intervention results, through the EEMJ, a significant increase was found in the respondents' perceptions about the role of patients as teachers in the teaching of communication and empathy. These results support the idea that students will remember what patients say and see their perspectives as beneficial [25].

This fact could be indicating that the care model proposed in the dentistry clinical component, where the performance of procedures is above the communication that can be established between a dentist and a patient, could be privileging the cognitive component of empathy for the detriment of favoring a better behavior of the affective component of the empathy and the subsequent gain of results in health care.

In the same way, when considering the components of empathy, the analysis must start at the behavior that each component in general showed. Empathy varies among individuals depending on social, educational factors, and personal experiences, and it is considered an interpersonal skill and a component of clinical competence [13]. The fact that dental practice has a decisive character in clinical care and gives time for the establishment of an environment of communication with the patient, could explain the better behavior of the cognitive aspect of empathy over affective behavior.

## Conclusion

The general results obtained in empathy levels improved in relation to those described in 2012, being the questions that obtained significant scores were the ones related to the cognitive component of empathy. This could be explained by incorporating a greater amount of community activities into the vulnerable population in the learning program of the Intra-hospital Rotation and Extramural Rotations of the 4th undergraduate year as well as with the reformulation of the of Promotion and Prevention Clinic Components of the 2nd undergraduate year when having contact with real patients, within the implementation of the new Curriculum. The fact that the most significant results were related to the cognitive component are possibly due to the operative nature of the dental treatments above the establishment of a dentist-patient communication that privileges the development of the affective component of empathy.

## References



1. Gerstner J. La comunicación médico-paciente. *Rev Colomb Ortop Traumatol* 2002; 16 (3):6-7.
2. Stewart MA. Effective physician-patient communication and health outcomes: A review. *CAJM* 1995; 152(9):1423-33.
3. Ogle J, Bushnell JA, Caputi P. Empathy is related to clinical competence in medical care. *Med Educ* 2013; 47(8):824-33. doi: 10.1111/medu.12232.
4. Neuwirth ZE. Physician empathy. Should we care? *Lancet* 1997; 350(9078):606. doi: 10.1016/S0140-6736(05)63323-5.
5. Ventura FG, Huerta BQ, Pinedo ML, Vergaray JM, Narváez VPD, Zamorano A, Rivera I. Measuring the level of empathic perception of students of the Faculty of Dentistry Robert Beltrán. Cayetano Heredia Peruvian University. *Rev Estomatol Herediana* 2012; 22(2):91-9.
6. Erazo Coronado AM, Alonso LM, Rivera I, Zamorano A, Díaz VP. Measurement of empathetic orientation in dentistry students of Metropolitana University of Barranquilla (Colombia). *Salud Uninorte* 2012; 28(3):354-63.
7. Bullen M, Salazar L, Díaz-Narváez VP. Empathic orientation of dental students from the University of Panama (Republic of Panama). *Salud Uninorte* 2015; 31(2):266-75. doi: 10.14482/sun.30.1.4309.
8. Alonso LM, Caro SE, Erazo AM, Díaz-Narváez VP. Measurement of empathetic orientation in medicine students of Universidad del Norte. Barranquilla (Colombia). *Salud Uninorte* 2013; 29(1):22-33.
9. Galán JM, Romero R, Morillo MS, Alarcón M. Decreasing empathy in nursing students and analysis of possible factors involved. *Psicología Educativa* 2014; 20(1):53-60. doi: 10.1016/j.pse.2014.05.007.
10. Carrasco DE, Bustos A, Díaz-Narváez V. Orientación empática en estudiantes de odontología chilenos. *Rev Estomatol Herediana* 2012; 22(3):145-51.
11. Bilbao J, Alcocer A, Salazar G, Rivera I, Zamorano A, Díaz V. Measurement of empathetic orientation in Dentistry students of Fundación Universitaria San Martín. Puerto Colombia (Atlántico, Colombia). *Salud Uninorte* 2013; 29(1):34-41.
12. Ugalde IR, Bulboa RA, Arancibia AZ, Díaz-Narváez VP. Measurement of empathetic orientation in Dentistry students. *Salud Uninorte* 2011; 27(1):63-72.
13. Moreto G, González-Blasco P, Piscina L, Craice-de Benedetto MA. Empathy erosion of medical students: Report of a study conducted in one medical school in São Paulo, Brazil. *Atem Fam* 2014; 21 (1):16-9. doi: 10.1016/S1405-8871(16)30005-0.
14. Alcorta-Garza A, González-Guerrero JF, Tavitás-Herrera SE, Rodríguez Lara FJ, Hojat M. Validación de la escala de empatía Médica de Jefferson en estudiantes de medicina mexicanos. *Salud Mental* 2005; 28(5):57-63.
15. Silva Urday H, Rivera Ugalde I, Zamorano Arancibia A, Díaz-Narváez VP. Evaluation of empathetic orientation in dentistry students of Finis Terrae University in Santiago, Chile. *Rev Clin Periodoncia Implantol Rehabil Oral* 2013; 6 (3): 130-133. doi: 10.1016/S0718-5391(13)70136-8.
16. Silva MG, Arboleda Castillo J, Díaz-Narváez VP. Orientación empática en estudiantes de odontología de la Universidad Central del Este. *Odontoestomatología* 2013; 15(22):24-33.
17. Jiménez LS, Guevara MP, Ugalde IR, Arancibia AZ, Narváez VPD. Evaluation of empathetic orientation in Odontology students. *Educ Med Super* 2013; 27(3):216-25.
18. Martínez FDG, Díaz-Narváez VP, Vergara KA, Cárdenas SD, Amador LRT, Anaya MM. Distribution of empathetic orientation among dentistry students of Cartagena, Colombia. *Rev Salud Pública* 2015; 17(3):404-15. doi: 10.15446/rsap.v17n3.37591.
19. Beattie A, Durham J, Harvey J, Steele J, McHanwell S. Does empathy change in first-year dental students? *Eur J Dent Educ* 2012; 16(1):111-16.
20. Prabhu S, Kumar S, Prasanth S. Standing in patients' shoes - survey on empathy among dental students in India. *J Educ Ethics Dent* 2014; 4(2):69-73. doi: 10.4103/0974-7761.148990.
21. Babar MG, Omar H, Lim LP, Khan SA, Mitha S, Ahmad SFB, Hasan SS. An assessment of dental students' empathy levels in Malaysia. *Int J Med Educ* 2013; 4:223-9. doi: 10.5116/ijme.5259.4513.
22. Díaz-Narváez VP, Muñoz-Gámbaro G, Duarte-Gómez N, Reyes-Martínez MC, Caro SE, Calzadilla-Núñez A, Palacio LMA. Empatía en estudiantes de enfermería de la Universidad Mayor, sede Temuco, IX región, Chile. *Aquichan* 2014; 14(3):388-402. doi: 10.5294/aqui.2014.14.3.9.
23. Mejía MA, Poveda JM, Paoli M, Díaz V. Empathic behavior in health science students. University of Los Andes. *Fermentum. Rev Venez Sociol Antropol* 2012; 23(67):203-20.

24. Park KH, Roh H, Suh DH, Hojat M. Empathy in Korean medical students: Findings from a nationwide survey. *Teach Med* 2015; 37(10):943-8. doi: 10.3109/0142159X.2014.956058.
25. Schwartz B, Bohay R. Can patients help teach professionalism and empathy to dental students? Adding patient videos to a lecture course. *J Dent Educ* 2012; 76(2):174-84.
26. Huberman J, Rodríguez MP, González S, Díaz-Narváez VP. Empathetic orientation levels in odontology students of the Universidad del Desarrollo, sede Santiago (Chile). *Rev Clin Periodoncia Implantol Rehabil Oral* 2014; 7(3):169-74. doi: 10.1016/j.piro.2014.11.001.
27. Salcedo-Rioja MR, Díaz-Narváez VP. Empathy in dental students of National University of San Marcos (Peru). *Salud Uninorte* 2015; 31(3):565-74. doi: 10.14482/sun.31.3.6801
28. Bilbao JL, Iglesias JE, Díaz-Narváez VP, Crespo-Camacho S, Alonso LM, Alcocer A. Empathic guidance in medical students of the Universidad Libre and San Martín, Barranquilla, Colombia. *Rev Fac Med* 2015; 63(4):657-63. doi: 10.15446/revfacmed.v63.n4.49715.
29. Silva MG, Arboleda Castillo J, Díaz-Narváez VP. Empathic orientation observed in medical students at one university in the Dominican Republic. *Educ Med Super* 2014; 28(1):74-83.
30. Montilva M, García M, Torres A, Puertas M, Zapata E. Empathy according to Jefferson scale in medical and nursing students in Venezuela. *Inv Ed Med* 2015; 4(16):223-8. doi: 10.1016/j.riem.2015.04.006.
31. Díaz-Narváez VP, Salas D, Bracho F, Ocaranza J. Empathy in students of specialty in physical therapy, Universidad Mayor in Temuco, Chile. *Rev Cienc Salud* 2015; 13(3):383-93. doi: 10.12804/revsalud13.03.2015.05.
32. Brown T, Williams B, Boyle M, Molloy A, McKenna L, Molloy L, Lewis B. Levels of empathy in undergraduate occupational therapy students. *Occup Ther Int* 2010; 17(3):135-41. doi: 10.1002/oti.297.
33. Varela de Villalba TB, Villalba RH, Gargantini P, Quinteros S, Villalba SB, Díaz Narváez VP. Levels of emphatic orientation in dental students of the Catholic University of Cordoba, Argentina (UCC). *Claves Odontol* 2012; 19(70):15-22.
34. Remón-Torres MA, Remón-Torres MM, Tataje-Lavanda MK. Level of empathy to patient two internal medicine peruvian hospitals. *Rev Med Panacea* 2013; 3(1):2-5.
35. Anaya MVM, Amador LRT, Martínez FG. Factors related to empathy in medical students at the University of Cartagena. *Rev Clín Med Fam* 2015; 8(3):185-92. doi: 10.4321/S1699-695X2015000300003.
36. Boyle DA. Countering compassion fatigue: A requisite nursing agenda. *Online J Issues Nurs* 2011; 16(1):2. doi: 10.3912/OJIN.Vol16No01Man02.
37. Vélez CD, Chinchay JLS, Bravo VR, Cotrina YAG, Salazar RMF, Vasquez CDD. Empathy in medical students from the Universidad Nacional Pedro Ruiz Gallo: May-June 2011. *Rev Cuerpo Méd HNAAA* 2012; 5(3):17-21.
38. Fernández-Pinto I, López-Pérez B, Márquez M. Empathy: Measures, theories and applications under review. *Anales Psicol* 2008; 24(2):284-98.
39. Rosenzweig J, Blaizot A, Cougot N, Pegon-Machat E, Hamel O, Apelian N, Bedos C, Munoz-Sastre MT, Vergnes JN. Effect of a person-centered course on the empathy ability of dental students. *J Dent Educ* 2016; 80(11):1337-48.